REMARKS

Claims 1-6 are pending in the application.

Claims 1-3 and 4-6 have been amended to clarify that step 1 is conducted in the absence of the tetraaryl borate compound used in step 2 and wherein the solution of the phosphine hydrochloride (claims 1-3) or sulfate (claims 4-6) obtained in step 1 and provided for step 2 is not subjected to concentration. This amendment is supported at least by the Examples, such as Example A-1 and A-3, and at paragraph [0019]. No new matter has been added to the application by the foregoing amendments.

At pages 2-3 of the Office Action, claims 1-3 have been rejected under 35 U.S.C. §102(b) as being anticipated by Smith et al., "Phosphorus mustards. 1-3 III. Bis(2-chloroethyl)methylphosphine oxide and bis(2- benzoxyethyl)methylphosphine", *J. Med. Chem.*, 11(5), 1060-3}. The Office Action contends that Smith et al. disclose Applicants' claimed process for producing phosphonium borate compound (tri-n-butylphosphonium tetraphenylborate). See page 1063, column 2; paragraph 5.

Applicants respectfully traverse this rejection and request that the rejection be reconsidered and withdrawn.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

At page 1063, column 2, paragraph 5, Smith et al. describes that "Evacuation at 25°C (0.1 mm) afforded a hygroscopic viscous syrup", i.e., the solution of tri-n-butylphosphine in 80 ml of $CHCl_3$ through which dry HCl had been bubbled (i.e., the $CHCl_2$ solution of tri-n-butylphosphine hydrochloride: $(n\text{-}Bu)_3PH$ Cl)) was subjected to concentration by evacuating $CHCl_3$, and the concentrated solution of tri-n- butylphosphine hydrochloride: $(n\text{-}Bu)_3PH$ Cl) (i.e., the syrup) was provided to the reaction with sodium tetraphenylborate: $Na\text{-}BPh_4$ in MeOH to yield the phosphonium salt (67%).

On the contrary, claims 1-3, as amended, specify that the solution of the phosphine hydrochloride obtained in step 1 is *not* concentrated before being provided to step 2.

As shown in the Example A-1 at page 105, line 11 to page 106, line 21 of the present specification, and the citation in the Example A-3 at page 110, line 3, an aqueous

solution of tri-tert-butylphosphine hydrochloride: $(tert\text{-}Bu)_3PH$ Cl (Example A-1) or tri-n-butylphosphine hydrochloride: $(n\text{-}Bu)_3PH$ Cl (Example A-3) obtained in the first step is used directly (without concentration) to add to solution of sodium tetraphenylborate: Na BPh_4.

The difference of the steps between the processes of the present invention and Smith et al. also results in a remarkable difference of yield. Regarding $(n\text{-}Bu)_3PH$ BPh_4, for example, the process of the present invention can afford the yield of 90% (Example A-3: page 110, line 7), which is remarkably higher than the yield of 67% b Smith et al.

Furthermore, the inventor conducted another comparative example to produce $(tert\text{-}Bu)_3PH$ BPh_4, in which the concentration step (evacuation) is in accordance with the step of Smith et al. and the other steps are in accordance with Example A-1 of the present invention (page 105, line 11 to page 107, line 18), the results of which are submitted herewith in the Declaration of Shin Masaoka pursuant to 37 C.F.R §1.132.

Mr. Masaoka graduated from the Graduate School of Engineering, Hiroshima University in March, 1996. Masaoka Declaration at Paragraph 1. Since April, 1996, Mr. Masaoka has been an employee of Hokko Chemical Industry Co., Ltd., and till the present time, he has been engaged in the Fine Chemicals Process Research Department. Masaoka Declaration at Paragraph 1.

Mr. Masaoka is familiar with the subject matter of U.S. Application Serial No. 10/580,699, of which he is an inventor. Masaoka Declaration at Paragraph 2. Also, he is familiar with the rejection of claims 1-3 under 35 U.S.C. §102(b) as being anticipated by Smith et al., "Phosphorus mustards. III. Bis(2-chloroethyl)methylphosphine oxide and bis(2-benzoxyethyl)methylphosphine", J. Med. Chem., 11(5), 1060-3 (Sept. 1968); claims 1-3 under 35 U.S.C. §102(b) as being anticipated by Ayllon et al., "Proton Transfer in Aminocyclopentadienyl Ruthenium Hydride Complexes", Organometallics, 18(20), 3981-3990 (1999); and claims 1-6 under 35 U.S.C. §103(a) as being unpatentable over Smith et al. or Ayllon et al. in the '699 application. Masaoka Declaration at Paragraph 2.

The following experiment was conducted either by Mr. Masaoka or under his direct supervision. This experiment demonstrates that a yield of tri-tert-butylphosphonium tetraphenylborate: $(tert\text{-}Bu)_3PH{\cdot}BPh_4$ by a process including the concentration step according to Smith et al. is 66%. Masaoka Declaration at Paragraph 3.

[Comparative Example]

Production of tri-tert-butylphosphonium tetraphenylborate

A 300-ml four-necked flask sufficiently purged with argon was equipped with a stirrer, a thermometer and a reflux condenser. 8.1 g (40 mmol) of tri-tert-butylphosphine and 130 ml of chloroform were weighed in the flask, followed by stirring to dissolve tri-tert-butylphosphine. While the stirring was continuously carried out, hydrochloric acid gas was bubbled through the solution at 0°C for 15 minutes. The reflux condenser was replaced with a distiller. The solution was concentrated at 25°C at 0.1 mm Hg to obtain a residue. Masaoka Declaration at Paragraph 3.

A 300-ml four-necked flask was equipped with a stirrer, a thermometer and a reflux condenser. 15.1 g (44 mmol) of sodium tetraphenylborate and 60 ml of methanol were weighed in the flask, followed by stirring to dissolve sodium tetraphenylborate. While the stirring was continuously carried out, the residue was added to the solution, and the mixture was stirred at 25°C for 3 hours. After the completion of the reaction, the precipitated product was filtered off. The so-obtained crystal was suspended in 100 ml of toluene at 50°C, and the suspension was cooled to 25°C and filtered. The product filtered off was washed with 100 ml of toluene. The crystal was then suspended in 100 ml of methanol at 50°C, and the suspension was cooled to 25°C and filtered. The product filtered off was washed with 100 ml of methanol. The crystal obtained was dried to give 13.7 g of objective tri-tert-butylphosphonium tetraphenylborate as white crystal. The yield (mol%) was 66% based on tri-tert-butylphosphine. Masaoka Declaration at Paragraph 3.

The crystal was analyzed by the same methods as indicated in Example 1 of the Specification and was identified to be tri-tert-butylphosphonium tetraphenylborate. Masaoka Declaration at Paragraph 3.

Therefore, according to the supplemental experimental data, yield of (tert-Bu)$_3$PH-BPh$_4$ by which the process of Smith et al. is only 66%. In contrast, the yield is 87% (Example A-1; page 106, line 21) by the process of the present invention. It may be speculated that the concentration step has a negative influence upon phosphine hydrochlorides dissolved in the solution obtained in step 1.

Smith et al. discloses that the phosphine hydrochloride is concentrated before reaction with the tetraphenylborate. Smith et al. does not disclose using the phosphine hydrochloride without concentration, as set forth in present claims 1-3 as amended. Thus,

Smith et al. fails to disclose an element of claims 1-3 and therefore does not anticipate claims 1-3.

For at least the foregoing reasons, Applicants assert that claims 1-3 are novel over the disclosure of Smith et al.

At page 3 of the Office Action, claims 1-3 have been rejected under 35 U.S.C. §102(b) as being anticipated by Ayllon et al., "Proton Transfer 1-3 in Aminocyclopentadienyl Ruthenium Hydride Complexes", *Organometallics*, 18(20), 3981-3990. The Office Action contends that Ayllon et al. disclose Applicants' claimed process for producing phosphonium borate compound (tri-n-butylphosphonium tetraphenylborate). See page 3989, column 1; paragraph 3.

Applicants respectfully traverse this rejection and request that the rejection be reconsidered and withdrawn.

Ayllon et al. discloses that the reaction between $P(n\text{-}Bu)_3$ and HCl is conducted in the presence of Na(BPh)4 as P(n-Bu), HC1 and Na(BPh)4 are admixed at once. On the contrary, as set forth in present claims 1-3, as amended, the reaction between $P(n\text{-}Bu)_3$ and HCI is conducted in the absence of $Na(BPh)_4$ as P(n-Bu)s and HCI are admixed first (step 1) and stepwisely the product (n-Bu)PH Cl is admixed with $Na(BPh)_4$ (step 2). Thus, the disclosure of Ayllon et al. does not anticipate present claims 1-3.

The difference of the steps between the process by the present invention and Ayllon et al results in a remarkable difference of yield. Regarding $\{HP(n\text{-}Bu)_3\}(BPh)_4$, for example, the process of the present invention can afford the yield of 90% (Example A-3 page 110, line 7), which is remarkably higher than the yield of 53% by Ayllon et al. As described at page 6, lines 4-11 of the Specification, the process by Ayllon et al. is considered to cause a side reaction between $P(n\text{-}Bu)_3$ and the product of $Na(BPh)_4$ and HC1, which causes the deterioration of yield of $\{HP(n\text{-}Bu)a\}(BPh)_4$. The stepwise process of the present invention can prevent such a side reaction and deterioration of the yield.

For at least the foregoing reasons, Applicants assert that claims 1-3 are novel over the disclosure of Ayllon et al.

At pages 4-5 of the Office Action, claims 1-6 have been rejected under 35 U.S.C. §103(a) as being obvious over Smith et al. or Ayllon et al. The Office Action alleges that Smith et al. teaches Applicants' claimed process for producing phosphonium borate compound (tri-n-butylphosphonium tetraphenylborate), referring to page 1063, column 2;

paragraph 5. The Office Action contends that Ayllon et al. teaches Applicants' claimed process for producing phosphonium borate compound (tri-n-butylphosphonium tetraphenylborate). See page 3989, column 1; paragraph 3. The Office Action acknowledges that Smith et al. and Ayllon et al. process for producing phosphonium borate compound differs from the instant claims in that Applicants claim a process that employ HCl and H_2SO_4 as reagents while Smith et al. and Ayllon et al. teach a process that employed HCl as a reagent. The Office Action contends that the instantly claimed process for producing phosphonium borate compound would have been obvious to one of ordinary skill in view of the process taught by Smith et al. and Ayllon et al. because the references cited teach the use of inorganic acid, arguing that one of ordinary skill in the art would have a reasonable expectation of success in practicing the instant invention by correlating the teachings of the references cited by evaluating different commercially available inorganic acids to prepare phosphonium borate compounds as desired. Said person allegedly would have been motivated to practice the teachings of the references cited because the references demonstrated the use of the phosphonium borate compounds in industrial applications. The Office Action concludes that the instantly claimed invention would therefore have been obvious to one of ordinary skill in the art.

Applicants respectfully traverse this rejection and request that the rejection be reconsidered and withdrawn.

As reiterated by the Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. ___, 82 U.S.P.Q.2d 1385 (2007), the framework for the objective analysis for determining obviousness under 35 U.S.C. §103 is stated in *Graham v. John Deere*. Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, 72 Fed. Reg., No. 195 (October 10, 2007) at page 57527 (hereinafter "Examination Guidelines"). The factual inquiries enunciated by the Court are as follows:

(1) Determining the scope and content of the prior art;

(2) Ascertaining the differences between the claimed invention and the prior art; and

(3) Resolving the level of ordinary skill in the pertinent art.

Examination Guidelines at page 57527.

As discussed above, Smith et al. concentrates the phosphine hydrochloride prior to adding tetraphenylborate. Smith et al. does not suggest or disclose phosphine

hydrochloride without concentration for reaction with tetraphenylborate, as set forth in claims 1-6. The advantages in yield are discussed in detail above, and would not be obvious to one of ordinary skill in the art from the disclosure of Smith et al.

Ayllon et al. discloses that the reaction between $P(n\text{-}Bu)_3$ and HCl is conducted in the presence of Na(BPh)4 as P(n-Bu), HC1 and Na(BPh)4 are admixed at once. On the contrary, as set forth in present claims 1-6, as amended, the reaction between $P(n\text{-}Bu)_3$ and HCI is conducted in the absence of $Na(BPh)_4$ as P(n-Bu)s and HCI are admixed first (step 1) and stepwisely the product (n-Bu)PH Cl is admixed with $Na(BPh)_4$ (step 2). Thus, the disclosure of Ayllon et al. does not anticipate present claims 1-6. The advantages in yield are discussed in detail above, and would not be obvious to one of ordinary skill in the art from the disclosure of Ayllon et al.

Further, neither Smith et al. nor Ayllon et al. suggest or disclose using H_2SO_4 as a reagent to produce a phosphine sulfate, as set forth in present claims 4-6.

Accordingly, for at least the foregoing reasons, Applicants assert that claims 1-6 are not obvious over the disclosures of Smith et al. and Ayllon et al. and request that the rejections of claims 1-6 over Smith et al. or Ayllon et al. be reconsidered and withdrawn.

Applicants respectfully assert that all of the pending claims distinguish over the cited prior art. Accordingly, Applicants respectfully request entry and consideration of the above amendments and allowance of all of the pending claims.

Respectfully submitted,
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